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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,230	06/16/2006	Fabien Frederic Jousse	T7106(C)	8226

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EXAMINER

KWAK, DEAN P

ART UNIT	PAPER NUMBER
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1797

NOTIFICATION DATE	DELIVERY MODE
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09/29/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentgroupus@unilever.com

Office Action Summary	Application No. 10/583,230	Applicant(s) JOUSSE, FABIEN FREDERIC	
	Examiner Dean Kwak	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-12 is/are pending in the application.
- 4a) Of the above claim(s) 7-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 2 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for “first and second microfluidic reactors”, does not reasonably provide enablement for “1,000 microfluidic reactors” (Claim 2). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The specification is not enabling because it is not clearly stated how 1,000 reactors and channels are being connected.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 1, 2 & 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen et al. (WO 01/28670).

Regarding Claims 1, 4 & 6, Allen et al. disclose a microfluidic system (e.g., microfluidic mixer, P3/L19-20 & Fig. 1 (100)) comprising:

- first and second fluid supply sources (e.g., first fluid and second fluid, respectively, P13/L19-20 & Fig. 6 (602, 604)),
- the first and second supply sources supplying at least a first and second microfluidic reactors arranged in parallel (e.g., mixers, P13/L22-23 & Fig. 6 (606, 608)) via an upstream channel or channels (e.g., nozzle channels, P4/L17-18 & Fig. 2a (222, 224)), said upstream channel or channels positioned before the microfluidics reactors,
- the at least first and second reactors each having at least one downstream channel which is positioned after the reactors (e.g., exit channel, P13/L26, Fig. 6 (614)).

Regarding the resistance of its upstream channel at least 10, 100 times larger than the downstream channel, it is noted that the channel width l and nozzle width b (upstream channels) are smaller than the exit channel width m (downstream channels), see Fig. 2a. Therefore, while mixing the same viscosity fluids and the surface of each channels and reactors are made of same material with same surface smoothness, it will inherently display the flow resistance of all the

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upstream channels of the reactors is higher than the flow resistance in the down stream channels, see MPEP § 2112.

Although Allen et al. do not explicitly disclose regarding flow resistance, it is well known in the art of fluid dynamics that varying cross-sectional dimensions result in varying flow rates (see evidential reference disclosed in IDS filed on 10/31/2006, Chan et al. (WO 01/57509), P12/L1-4 & Claim 20). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the channel dimensions to increase the resistance of upstream channels at least 10, 100 times larger than the resistance of the downstream channels to change the flow rate to modify mixing and reaction rate of fluids.

Regarding Claim 2, Allen et al. disclose all of the claim limitations as set forth above. While Allen et al. fail to disclose the number of microfluidic reactors, it is noted that by use of many parallel microfluidic devices, the recited limitation can be met. In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to connect a plurality of microfluidic devices, since it has been held that forming in one piece an article which has formerly been in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1993). Further, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use 1,000 microfluidic reactors to study multiple reactions in parallel.

Regarding Claim 5, Allen et al. further disclose a microfluidic system wherein the microfluidic reactors are all identical (see identical reactors in Fig. 6 (606)).

Response to Arguments

6. Applicant's arguments filed 07/01/2009 have been fully considered but they are not persuasive.

7. Regarding 112, first paragraph rejection, Examiner maintains the rejection. It is noted that as stated in the specification P7, "...any number of parallel microfluidic units..." does not automatically support the claimed 1,000 reactors. Based upon this disclosure, one having ordinary skill in the art could not readily pick any specific number of reactors, such as 1,000 and have a reasonable expectation of success.

8. In response to applicant's argument on Page 11 of the Remarks that "*these features can not be 'upstream channels which must be positioned before the microfluidics reactors and are not part of the reactor'*", it is noted that where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the term "nozzle channels" is considered as "upstream channel" for the purpose of this office action. Therefore, Fig. 6 of Allen et al. discloses said limitations as rejected above.

9. In response to applicant's argument on Page 12 that "*whose diameters are of comparable size to the down stream channels 112 and 114 and thus, would be expected to have comparable resistances (see Fig 1 and 2a)*", it is noted that Fig. 2a discloses, as example, $l_3 = 2.94b$ and $m = 6.7b$, wherein b is the nozzle width. Therefore, in constant conditions where only cross sectional areas vary, ' m ' would create less hydrodynamic resistance than ' l_3 '.

10. In response to applicant's argument regarding the resistance of its upstream channel at least 10, 100 times larger than the downstream channel, it is noted that the channel width l and

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nozzle width b (upstream channels) are smaller than the exit channel width m (downstream channels), see Fig. 2a. Therefore, while mixing the same viscosity fluids and the surface of each channels and reactors are made of same material with same surface smoothness, it will inherently display the flow resistance of all the upstream channels of the reactors is higher than the flow resistance in the down stream channels, see MPEP § 2112.

Although Allen et al. do not explicitly disclose regarding flow resistance, it is well known in the art of fluid dynamics that varying cross-sectional dimensions result in varying flow rates (see evidential reference disclosed in IDS filed on 10/31/2006, Chan et al. (WO 01/57509), P12/L1-4 & Claim 20). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the channel dimensions to increase the resistance of upstream channels at least 10 times larger than the resistance of the downstream channels to change the flow rate to modify mixing and reaction rate of fluids.

11. In response to applicant's argument regarding result effective variable, it is noted that Allen et al. disclose variables such as 'l3', 'b', 'm' as well as possible lower and upper multiplier for the inlet channel width 'l3', see P6-7, Table 1. Consequently, this argument is not found persuasive.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean Kwak whose telephone number is 571-270-7072. The examiner can normally be reached on M-TH, 5:30 am - 4:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LYLE A ALEXANDER/
Primary Examiner, Art Unit 1797

15Sep09

/D. K./

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